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# Glossary: A

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ABCDEFGHIJKLMNOPQRSTUVWXYZ

### ab initio.

A calculation or prediction that is based purely on theory rather than on experimental data. Accurate *ab initio* predictions are an important test of a theory. (Lat., "from first principles")

### abrasive.

A very hard, brittle, heat-resistant substance that is used to grind the edges or rough surfaces of an object. boron carbide, diamond, and corundum are abrasives.

### absolute error. absolute uncertainty. Compare with relative error<sup>†</sup>.

The uncertainty in a measurement, expressed with appropriate units. For example, if three replicate weights for an object are 1.00 g, 1.05 g, and 0.95 g, the absolute error can be expressed as  $\pm 0.05$  g. Absolute error is also used to express inaccuracies; for example, if the "true value" is 1.11 g and the measured value is 1.00 g, the absolute error could be written as  $1.00 \text{ g} - 1.11 \text{ g} = -0.11 \text{ g}$ .

Note that when absolute errors are associated with indeterminate errors<sup>†</sup>, they are preceded with " $\pm$ "; when they are associated with determinate errors<sup>†</sup>, they are preceded by their sign.

### absolute temperature.

Temperature measured on a scale that sets absolute zero<sup>†</sup> as zero. In the SI<sup>†</sup> system, the kelvin<sup>†</sup> scale is used to measure absolute temperature.

### absolute zero. (0 K)

The temperature at which the volume of an ideal gas<sup>†</sup> becomes zero; a theoretical coldest temperature that can be approached but never reached.

Absolute zero is zero on the Kelvin scale,  $-273.15^\circ\text{C}$  on the Celsius<sup>†</sup> scale, and  $-459.67^\circ\text{F}$  on the Fahrenheit scale.

### absorbance. (A, D, E) optical density; extinction; decadic absorbance.

A measure of the amount of light absorbed by a sample. The absorbance (A) equals minus the base-10 log of the transmittance<sup>†</sup>.

### absorption. absorb; absorbent. Compare with adsorption<sup>†</sup> and sorption<sup>†</sup>.

1. Penetration of molecules into the bulk of a solid or liquid, forming either a solution or compound. Absorption can be a chemical process (a strong solution of NaOH absorbs  $\text{CO}_2$  from the air) or a physical process (palladium absorbs hydrogen gas). 2. Capture and transformation of energy by a substance; for example, copper looks reddish because it absorbs blue light. An absorbent captures another material and distributes it throughout; an adsorbent captures another material and distributes it on its surface only.

### absorption spectroscopy. Compare with absorption spectrum<sup>†</sup>.

A technique for determining the concentration and structure of a substance by measuring the amount of electromagnetic radiation<sup>†</sup> the sample absorbs at

AgCl precipitate<sup>±</sup> negative, and dichlorofluorescein anions remain in solution. After the endpoint, the excess silver ions make the surface of the AgCl precipitate positive, and the dichlorofluorescein anions are adsorbed<sup>±</sup> onto their surface. Adsorption changes the color of the indicator from yellow-green to pink.

**aeration.**  aerate.

Preparation of a saturated solution<sup>±</sup> of air gases by either spraying the solution in air or by bubbling air through it.

**aerosol.**  Compare with colloid<sup>±</sup>.


A colloid<sup>±</sup> in which solid particles or liquid droplets are suspended in a gas. Smoke is an example of a solid aerosol; fog is an example of a liquid aerosol.

**agar.** 

A gel made from seaweed used to make salt bridges<sup>±</sup>.

**alanine.**  (A,  $\text{CH}_3\text{CH}(\text{NH}_2)\text{COOH}$ ) Ala; alpha-aminopropionic acid.

A naturally occurring aliphatic<sup>±</sup> amino acid<sup>±</sup> which is required for protein synthesis but is not essential in the diet. Beta-alanine ( $\text{NH}_2\text{CH}_2\text{CH}_2\text{COOH}$ ) also occurs naturally.

**alcohol.**  (ROH) Compare with phenol<sup>±</sup> and hydroxide<sup>±</sup>.

An alcohol is an organic compound with a carbon bound to a hydroxyl<sup>±</sup> group. Examples are methanol,  $\text{CH}_3\text{OH}$ ; ethanol,  $\text{CH}_3\text{CH}_2\text{OH}$ ; propanol,

$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ . Compounds with -OH attached to an aromatic ring<sup>±</sup> are called phenols<sup>±</sup> rather than alcohols.

**aldehyde.**  (RCHO)


An aldehyde is an organic compound with a carbon bound to a  $-(\text{C}=\text{O})-\text{H}$  group. Examples are formaldehyde ( $\text{HCHO}$ ), acetaldehyde,  $\text{CH}_3\text{CHO}$ , and benzaldehyde,  $\text{C}_6\text{H}_5\text{CHO}$ .

**aliphatic.**  Compare with aromatic<sup>±</sup>.

An organic compound that does not contain ring structures.

**aliquot.** 


A sample of precisely determined amount taken from a material.

**alkali metal.**  (alkaline earth metal) alkali metal element.

The Group 1 elements, lithium (Li), sodium (Na), potassium (K), rubidium (Rb), cesium (Cs), and francium (Fr) react with cold water to form strongly alkaline hydroxide solutions, and are referred to as "alkali metals". Hydrogen is *not* considered an alkali metal, despite its position on some periodic tables.

**alkalin .** 

Having a pH<sup>±</sup> greater than 7.

**alkalin earth.** 

An oxide of an alkaline earth metal<sup>±</sup>, which produces an alkaline<sup>±</sup> solution in reaction with water.